NEWS

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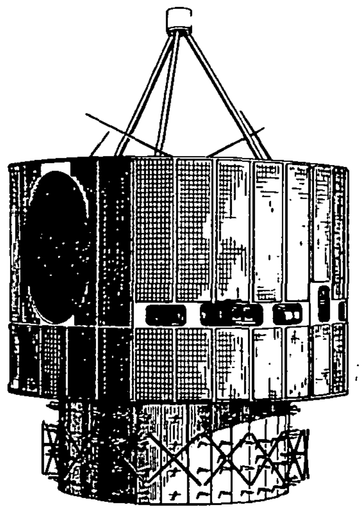

PROJECT: SMS-B

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D. C. 20546
(Phone: 202/755-8370)

FOR RELEASE:
SUNDAY,
January 26, 1975

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RELEASE NO: 75-6

SECOND SYNCHRONOUS-ORBIT WEATHER SATELLITE SCHEDULED

The second in a series of weather satellites, Synchronous Meterological Satellite-B, is scheduled for launch by NASA from Cape Canaveral, Fla. aboard a Delta rocket about Jan. 30.

SMS-B, to be designated SMS-2 when in orbit, will be placed in geosynchronous orbit over the equator at 36,357 kilometers (22,591 miles) altitude at 135 degrees west longitude, which is directly south of Sitka, Alaska, and about 15 degrees southeast of Hawaii. From this position it can view the western half of the United States and Hawaii while its sister spacecraft, SMS-1, can view the eastern U.S. from its perch at 75 degrees west longitude, on a line with New York City and just south of Bogota, Columbia.

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January 8, 1975

SMS-1, launched last May 17, provided the first synchronous-orbit, day-and-night photos of meteorological conditions extending from the east coast of Africa to the eastern U.S., as well as South America.

The two spacecraft will be able to keep a 24-hour watch on the Western Hemisphere and provide cloud-cover pictures every 30 minutes to weathermen out of the National Oceanic and Atmospheric Administration (NOAA). Each carries a Visible and Infrared Spin-Scan Radiometer (VISSR) that returns visible-light daytime pictures of 0.9-km (1/2-mi.) resolution and infrared images of 9-km (5-mi.) resolution day and night.
This continous coverage is of special importance for short-term phenomena such as the severe storm systems that procude tornadoes.

In addition, the west coast of Africa--the breeding grounds for hurricanes that strike the Caribbean, Florida, Gulf of Mexico and U.S. east coast areas--will be kept under the surveillance of SMS-1.

"Satellites are the cornerstone of the Hurricane Weather Service," Dr. Neil L. Frank, Director of NOAA's National Hurricane Center in Miami, said recently. "Because of satellites, there is no way a major hurricane or severe storm can strike the U.S. undetected," he said.

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The SMS pictures are made into film loops daily to show clouds moving over oceans and land masses. Such loops may well give meteorologists a clue as to what kind of cloud formation or weather conditions cause the sudden, death-dealing tornadoes that occur during the warm weather months. They also provide weathermen with detailed information on the movement of weather systems over the preceding few hours.

In addition, meteorologists at NASA's Goddard Space Flight Center, Greenbelt, Md; have made film loops of a number of different hurricanes, including the disastrous Fifi that devastated Honduras last fall. The ability to study weather conditions, moving fronts and systems 24 hours a day for weeks via film loops is important to a better understanding of weather and the ultimate formation of a world weather model.

About 45 days after launch, SMS-2 will be checked out in orbit and then turned over to NOAA for operational use, as has been done with SMS-1.

In addition to transmitting cloud-cover photos, SMS-2 will receive and transmit environmental information to NOAA from thousands of manned and unmanned data collection platforms around the U.S. on land, in rivers and lakes, and at sea.

The primary types of data to be obtained consist of meteorological, hydrological, oceanographic, seismic and tsunami information. For example, fixed platforms in remote land areas will send information on earthquakes, wind direction and velocity, rainfall and humidity. River platforms will measure currents, water levels and temperatures and air temperatures and give tsunami warnings.

Both SMS spacecraft also carry a space environment monitoring system that monitors solar particle flux, X-ray emission and magnetic field direction and strength.

As part of the Global Atmospheric Research Program (GARP), sponsored by the United Nations and International Council of Scientific Unions, the U.S. synchronous orbit spacecraft are expected to be joined, beginning in 1977, by similar spacecraft placed in orbit by the European Space Research Organization, Japan and Russia to form a global network of synchronous orbit satellites.

The SMS program is under the direction of NASA's Office of Applications, with project management the responsibility of the Goddard Space Flight Center. The Office of Space Science directs the Delta launch vehicle program and project management is the responsibility of Goddard.

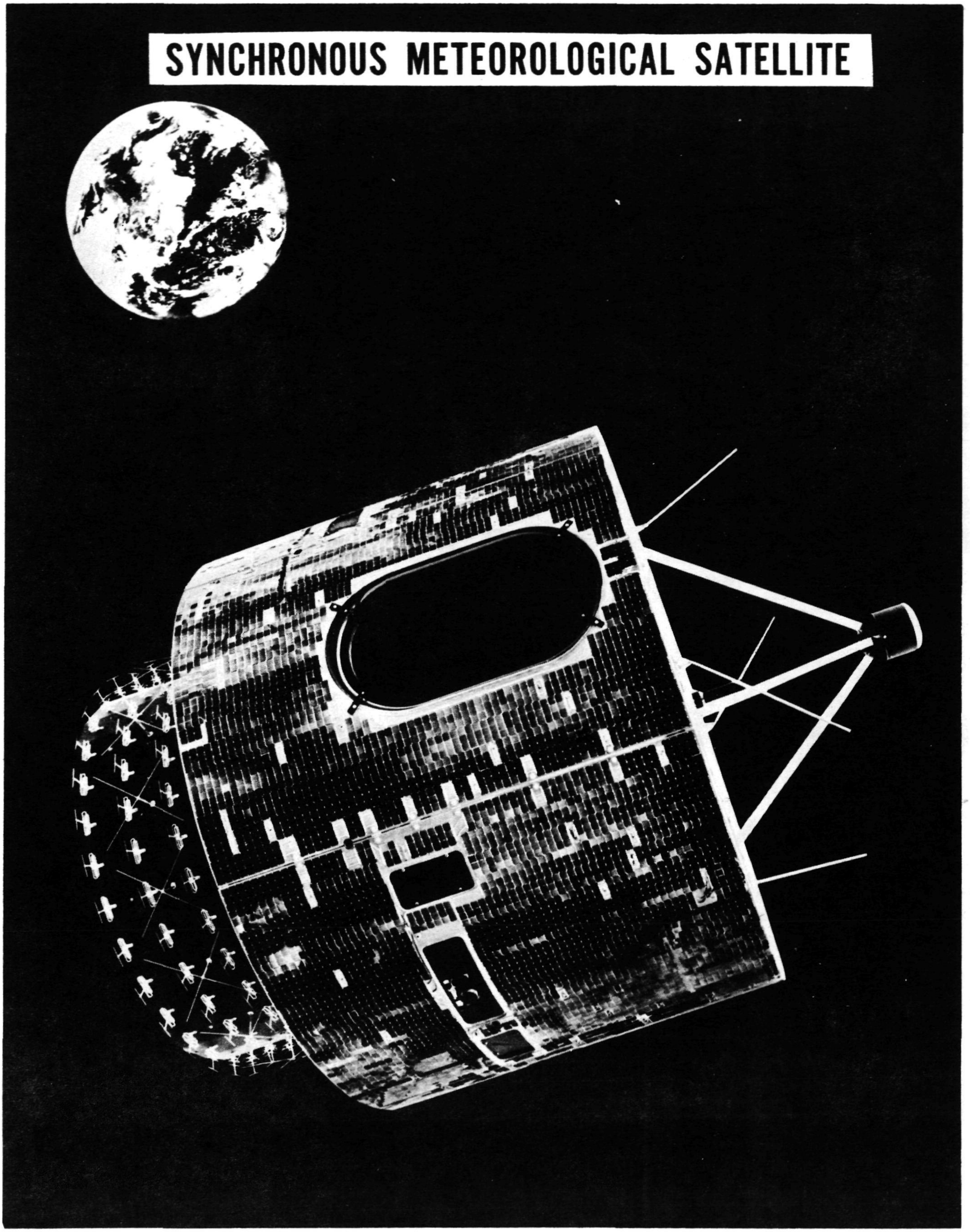
Philco-Ford, Palo Alto, Calif. is the spacecraft prime contractor. The Santa Barbara Research Center of the Hughes Aircraft Co. developed and produced the VISSR, the main sensor for SMS.

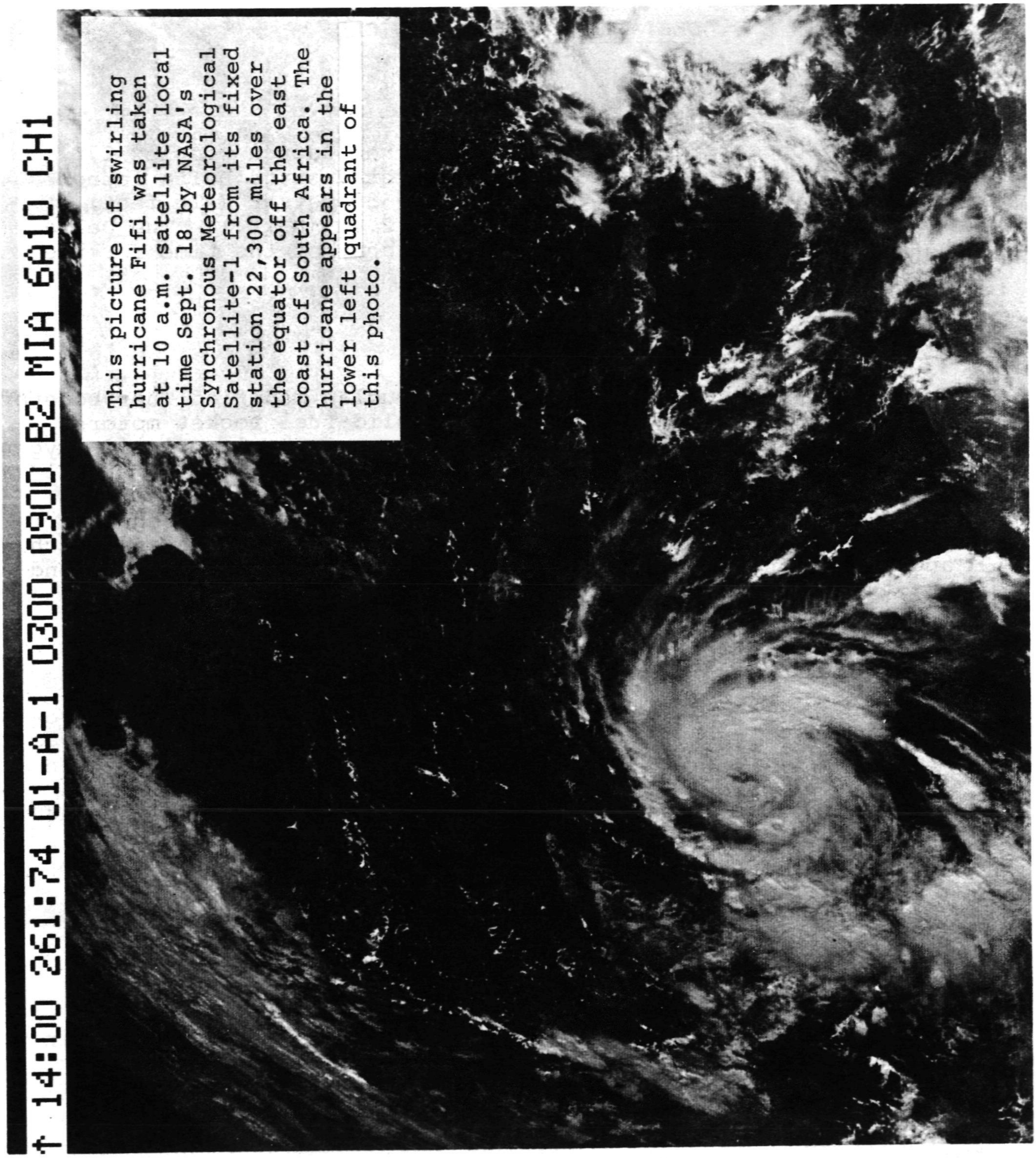
The Defense and Electronic Systems Center of the Westinghouse Corp., Baltimore, Md., was responsible for developing and producing the synchronizer data buffer which processes the SMS picture data. In addition, the center integrated the Command and Data Acquisition Station at Wallops Island, Va. McDonnell Douglas Astronautics Co., Huntington Beach, Calif. is the prime contractor for the Delta launch vehicle.

Launch site operations management is provided by the Kennedy Space Center's Unmanned Launch Operations Directorate.

The two spacecraft, including all onboard instrumentation, cost about $60 million, the Delta launch vehicles cost about $4.5 million each.

(END OF GENERAL RELEASE; BACKGROUND INFORMATION FOLLOWS)


SYNCHRONOUS METEOROLOGICAL SATELLITE



This picture of swirling hurricane Fifi was taken at 10 a.m. satellite local time Sept. 18 by NASA's Synchronous Meteorological Satellite-1 from its fixed station 22,300 miles over the equator off the east coast of South Africa. The hurricane appears in the lower left quadrant of this photo.

DELTA 2914 LAUNCH VEHICLE

SMS-B

The spacecraft will be launched from launch complex 17B at the Eastern Test Range, Fla. by a three-stage Delta launch vehicle. The vehicle is approximately 35 meters (116 feet) long, with a maximum body diameter of 2.4m (8 ft.). The Delta has been launched successfully 90 per cent of the time for the past 14 years.

First stage

The first stage is a McDonnell Douglas modified Thor booster incorporating nine strap-on Thiokol solid-fuel rocket motors. The booster is powered by a Rocketdyne engine using liquid oxygen and liquid hydrocarbon propellants. The main engine is gimbal-mounted to provide pitch and yaw control from liftoff to main engine cutoff (MECO). Two liquid-propellant vernier engines provide roll control throughout first stage operation and pitch and yaw control from MECO to separation of the first and second stages.

Second stage

The second stage is powered by a TRW liquid-fuel pressure-fed engine that also is gimbal-mounted to provide pitch and yaw control through second-stage burn. A nitrogen gas system using eight fixed nozzles provides roll control during powered and coast flight as well as pitch and yaw control during coast and after second-stage cutoff. Two fixed nozzles, fed by the propellant-tank, helium-pressurization system, provide retro-thrust after third-stage separation.

Third stage

The third stage is the TE-364-4 spin-stabilized solid-propellant Thiokol motor. The third-stage motor is secured in a spin table mounted to the second stage. The firing of eight solid propellant rockets fixed to the spin table accomplishes spin-up of the third-stage assembly.

Injection into synchronous orbit

The Delta vehicles will inject SMS-B into transfer orbit with an apogee of 36,357 km (22,591 mi.) on the first descending node of the parking orbit at five degrees east longitude. The apogee boost motor (ABM) will be fired to place the spacecraft in synchronous orbit on first or second apogee and drift to its station at 135 degrees west longitude at approximately six degrees each day.

STRAIGHT-EIGHT DELTA FACTS AND FIGURES

The Delta launch vehicle project is under the technical management of the Goddard Space Flight Center, Greenbelt, Md.; McDonnell Douglas Astronautics Co., Huntington Beach, Calif. is the prime contractor. The three-stage Delta has the following general characteristics:

Height 35.4 meters (116 feet) including shroud;

Maximum diameter 2.4 m (8 ft.) without attached solids;

Lift-off weight 133,180 kg (293,000 lbs.);

Lift-off thrust 1,741,475 N (391,343 lbs.),

including strap-on solids.

First stage (liquid only) consists of an extended long tank Thor, produced by McDonnell Douglas Astronautics Co. The engines, produced by the Rocketdyne Division of Rockwell International, have the following characteristics:

a diameter of 2.4 m (8 ft.);

a height of 21.3 m (70 ft.);

propellants of RJ-1 kerosene as the fuel and liquid oxygen (LOX) as the oxidizer;

a thrust of 912,000 N (205,000 lbs.);

a burning time of about three minutes and forty-eight seconds;

a weight of about 84,600 kg (186,000 lbs.) excluding strap-on solids.

Strap-on solids consist of nine solid propellant rockets produced by the Thiokol Chemical Corp., with the following features:

a diameter of 0.8 m (31 in.);

a height of 7 m (23.6 ft.);

a total weight of 40,300 kg (88,650 lbs.) for nine
4,475 kg (9,850 lbs.)each ;

a thrust of 2,083,000 N (468,000 lbs.) for nine
231,400 N (52,000 lbs.)each ;

a burning time of 38 seconds.

Second Stage: Produced by McDonnell Douglas Astronautics Co., utilizing a TRW TR-201 rocket engine; major contractors for the vehicle inertial guidance system located on the second stage are Hamilton Standard and Teledyne.

Propellants: Liquid -- Aerozene 50 for the fuel and

Nitrogen Tetroxide (N_2O_4) for the oxidizer.

Diameter: 1.5 m (5 ft.) plus 2.4 m (8 ft.)

attached ring.

Height: 6.4 m (21 ft.)

Weight: 6,180 kg (136,000 lbs.)

Thrust: About 42,300 N (9,500 lbs.)

Total Burning Time: 335 seconds

Third Stage: Thiokol Chemical Co. TE-364-4 motor.

Propellants: Solid

Height: 1.4 m (4.5 ft.)

Diameter: 1 m (3 ft.)

Weight: 1,160 kg (2,560 lbs.)

Thrust: 61,858 N (13,900 lbs.)

Burning Time: 44 seconds

LAUNCH OPERATIONS

The John F. Kennedy Space Center's Unmanned Launch Operations Directorate plays a key role in the preparation and launch of the three-stage, thrust-augmented Delta rocket carrying the Synchronous Meteorological Satellite.

Delta-108 will launch the SMS-B from pad B at Complex 17 at Cape Canaveral Air Force Station.

Complex 17 has two launch pads, but pad A is undergoing modifications to permit use of the larger Castor-4 solid strap-on motors and will not be used again until late 1975 or early 1976. A rapid launch rate was maintained from pad B during the final quarter of calendar 1974, with Delta launches averaging one a month.

A Westar domestic communications satellite was launched on Delta 103 on Oct. 10; Skynet II-B, a British military communications satellite, was launched aboard Delta 105 on Nov. 22; and Symphonie-A, a French-West German communications satellite, was launched on Delta 106 less than a month later on Dec. 18. All launches were successful.

The Delta 108 booster was erected on Pad B on Jan. 2. Four of the nine strap-on solid-fuel rocket motors were mated with the booster on Jan. 2 and the remaining five on Jan. 3.

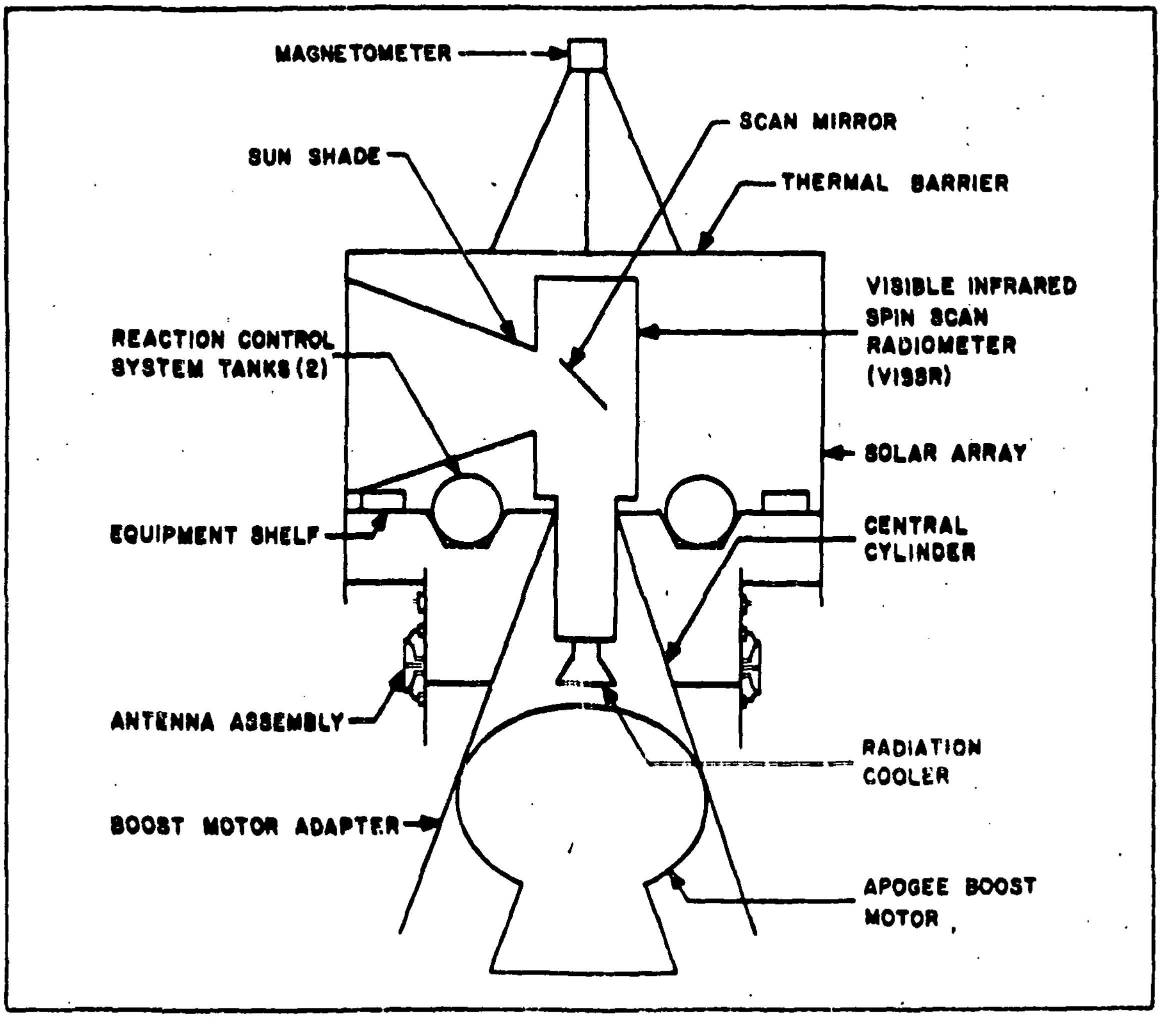
The second stage was erected on Jan. 6 and the third stage was to be placed atop the second stage on Jan. 20. A flight sequence test of the launch vehicle is to be conducted on Jan. 20.

The SMS-B spacecraft arrived at Cape Canaveral Air Force Station on Jan. 6 and was placed in hanger S for checkout and prelaunch preparations. The spacecraft is to be mated with Delta 108 on Jan. 23 and the payload fairing, which will protect SMS-B on its flight through the atmosphere, is to be placed atop the rocket and spacecraft several days before launch.

MAJOR DELTA 108/SMS-B FLIGHT EVENTS

EVENT	TIME	ALTITUDE Kilometers	ALTITUDE Miles	VELOCITY Meters/Second	VELOCITY Feet/Second
Liftoff	0 seconds	0	0	676	2,220
Six solid motor burnout	38 seconds	7.4	4.6	676	2,220
Three solid motor ignition	39 seconds	7.4	4.6	1,091	3,796
Three solid motor burnout	1 min. 17 sec.	24	15	1,204	4,100
Nine solid motor jettison	1 min. 27 sec.	25.6	16	5,303	17,500
Main engine cut-off (MECO)	3 min. 48 sec.	94	58.6	5,303	17,500
First/second stage separation	3 min. 56 sec.	101	63	5,297	17,481
Second stage ignition	4 min. 1 sec.	111	69.6	5,458	18,010
Fairing jettison	4 min. 35 sec.	126	79	7,792	25,715
Second stage first cut-off (SECO-1)	8 min. 50 sec.	167	104.6	7,777	25,665
Second stage restart	23 min. 53 sec.	178	111.5	7,867	25,981
Second stage second cutoff (SECO-2)	24 min. 1 sec.	178	111.5	7,874	25,973
Third stage spin up	24 min. 51 sec.	182	113.7	7,873	25,973
Second/third stage separation	24 min. 53 sec.	182	113.7	7,868	25,965
Third stage ignition	25 min. 31 sec.	184	115	10,198	33,654
Third stage burnout	26 min. 15 sec.	187	117	10,165	33,544
Third stage/spacecraft separation	27 min. 31 sec.	224	140	10,165	33,544

SMS SPACECRAFT CONFIGURATION



TRACKING AND DATA OPERATIONS

The Spaceflight Tracking and Data Network (STDN) will provide necessary support for the mission. The tracking stations include the Minitrack Network and stations at Johannesburg, South Africa; Tananarive, Malagasy Republic; Orroral, Australia; Santiago, Chile; Quito, Ecuador; Rosman, N.C.; and Wallops Island, Va.

The STDN and mission and data operations are managed by the Goddard Space Flight Center for NASA's Office of Tracking and Data Acquisition.

SMS-B MISSION FACTS AT A GLANCE

Launch:	From Complex 17, Eastern Test Range, Cape Canaveral, Fla.
Launch Vehicle:	Three-stage Delta rocket with 9 solid-motor thrust augmenters
Operating Lifetime:	Up to five years
Spacecraft Weight:	627 kilograms (1,379 pounds)
Structure:	Drum-shaped, measuring 345 centimeters (135.85 inches) high including magnetometers, which extends 83 cm (32.6 in.) beyond the spacecraft, and 190.5 cm (74.8 in.) in diameter. Consists of an aluminum honeycomb shelf, supported by struts and an apogee boost motor (ABM), 80 cm (31.5 in.) in diameter at the widest part and 90 cm (35.4 in.) long. The experiment section is enclosed by metallic cover and solar cell-covered side panels. The ABM, attached to the bottom, is ejected after synchronous orbit is attained.
Power System:	174 solar panels on the outer surface of the spacecraft provide 200 watts of power during normal spacecraft operation and decreasing over five years to 150 watts.
Telemetry & Command:	VHF in transfer orbit and S-Band on station. VISSR 1.7 ghz downlink and 2.0 ghz uplink.

Tracking and Data Acquisition:	Stations of the Spaceflight Tracking and Data Network (STDN) operated by NASA's Goddard Space Flight Center, Greenbelt, Md. during launch phase. In final orbit, CDA station, Wallops Island, Va., NOAA satellite Operating Control Center and Central Data Collecting and Processing Facility, Suitland, Md., Data Utilization Stations as designated by NOAA, some 500 automatic picture transmission stations and some 10,000 data collection platforms.

SMS-B PROGRAM OFFICIALS

NASA Headquarters

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Leonard Jaffe	Deputy Associate Administrator for Applications
William E. Stoney	Director of Earth Observations Programs
Dr. Morris Tepper	Director of Meteorology
Michael L. Garbacz	Manager, Operational Meteorological Satellite Programs
Noel W. Hinners	Associate Administrator for Space Science
Joseph B. Mahon	Director of Launch Vehicle and Propulsion Program
I.T. Gillam IV	Small Launch Vehicle and International Programs Manager
P.T. Eaton	Delta Program Manager

Goddard Space Flight Center

Dr. John F. Clark	Director
Robert N. Lindley	Director of Projects
Don V. Fordyce	SMS Project Manager
C.C. Johnson	Deputy Project Manager, Technical
A.H. Wessels	Deputy Project Manager, Resources
W.E. Shenk	Project Scientist
Geoffry Albert	Spacecraft Manager
Robert C. Baumann	Associate Director of Projects for Delta
Francis J. Lawrence	Delta Mission Integration Engineer

Kennedy Space Center

Lee R. Scherer	Director
John J. Neilon	Director, Unmanned Launch Operations
Hugh A. Weston, Jr.	Manager, Delta Launch Operations
John J. Dunn	Delta Spacecraft Operations

Contractors

Philco Ford, Palo Alto, Calif.	Prime contractor for spacecraft
Hughes Aircraft Co. Santa Barbara Research Center Santa Barbara, Calif.	Visible and infrared spin-scan radiometer
Westinghouse Corp. Baltimore, Md.	Ground station and integration and synchronizer/data buffer
McDonnell Douglas Astronautics Co. Huntington Beach, Calif.	Delta launch vehicle

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